TO: Industries in Lake Michigan Basin

The United States Public Health Service is making a study of Lake Michigan and its tributaries, a comprehensive study which will take several years. The purposes are as follows:

1. To determine present water quality in the various stretches of the rivers and lakes in the Lake Michigan basin.

2. Establish quality goals depending on the expected uses of each stretch, goals that are reasonably possible to attain through pollution control in the future.

3. To lay out a program for progressing toward these goals or maintaining them.

The study seems desirable and perhaps necessary for future economic health and pleasant living in the Lake Michigan area.

The writers are helping the Public Health Service with the No. 2 purpose. We are part of a nine-man committee of industrial representatives (Industrial Work Group) whose job is to establish guides for the quality of raw water to be used for industrial purposes (includes cooling water if supplied from same source as process water). Other work groups are establishing similar quality guides for other water uses (municipal, recreation, aquatic life, agriculture, transportation, cooling, and waste assimilation). The Public Health Service will use these various guides to establish the goals of quality that each stretch of water must meet to be reasonably satisfactory for its intended uses.

We need your help in setting the quality guides for industrial water. We are asking for similar help from other Michigan industries in the Lake Michigan basin. We realize that nearly all industry has to treat some of its water for certain uses, and that it is impractical to upgrade every lake and stream to make this treatment unnecessary, but we do need guides for the quality of raw water. Some industries need raw water with one or two special characteristics and this is where we need your help the most. Particularly if your industry is large or widespread in the Lake Michigan basin, a special water requirement deserves consideration in establishing a quality guide for industry as a whole.

Work in the Lake Michigan Basin has just begun, but the first phase of this study, covering the Illinois River Basin, is nearly complete. A previous Industrial Work Group has already established guides for the industrial water quality in the Illinois River Basin. We believe that the best way to ask you for help is to ask you if the guides for the Illinois River need any revision to be applied in the Lake Michigan Basin. We are attaching a table of these guides for your comment.

The table lists various indicators of quality and sets a range or limit for each. We would like you to review these numbers and suggest changes that your industry might require. It would also help if you could tell us in a few words the reason for each change. Please add other indicators and their limits if you think them important, but be sure that they are indicators that can easily be measured by standard methods.

Could you make your reply by March 15, 1965? Please reply to E. W. Watts at the address below. We are scheduled to present our guides at a meeting in Chicago on March 26th.

Respectfully,

D. L. Voigts, Technical Director
Packaging Corporation of America
Filer City, Michigan

E. W. Watts, Power and Trade Waste Supervisor
E. I. duPont de Nemours & Co.
Box A
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DLV/EWW:sas
Att.

PROPOSED GUIDES FOR WATER QUALITY

INDUSTRIAL WATER WORK GROUP (Illinois River Basin Study)

Water Uses	Total Coliform ~~E. Coli~~ Per 100 ml (Max.)	D.O. Mg/1 (Min.)	pH	Phenolics ~~Mg/1 (Max.)~~	Chloride Mg/1 (Max.)	ABS [Alkyl Benzene Sulfonate] Mg/1 (Max.)
Municipal Water Source	5,000	3.0	5-9	0.075 more research	250	0.5
Comment: Industrial Process Water	5,000	1.0	5-9	1.0	250	1.0
Recreational A. Swimming & Water Skiing Total Body Contact	1,000	[illegible]	5-9	1.0	NA	NA
B. Boating, Hunting Partial Body Contact	5,000	[illegible]	5-9	1.0	NA	NA
Irrigation	1,000-10,000	1.0	5-9	50	500	NA
Fish, Aquatic Life, Wildlife	?	5 W 5S	5-9	0.20	500	3.5
Livestock Watering, Domestic	?	[illegible]	5-9	Cumulative Effects?	1,000	NA
Miscellaneous A. Hydroelectric Power	NA	NA	5-9	NA	NA	NA
B. Commercial Shipping	NA	NA	5-9	NA	NA	NA
C. Cooling (Once-through)	NA	NA	5-9	NA	NA	NA
D. Waste Water Assimilation and transport	?	[illegible]	6.5-8.5	[illegible]	NA	NA
E. Esthetics	NA	1.0	NA	NA	NA	1.0

Not to be used unless a better Test Methods developed

Will be eliminated. Another practical Test will be substituted.

Note - Please comment on the Industrial Process Water Guides. You may also comment on the other water use guides if you so desire.

PROPOSED GUIDES FOR WATER QUALITY

INDUSTRIAL WATER WORK GROUP (CONT'D.)

Water Uses	BOD Mg/l (Max.)	Turbidity (Max.)	Desirable Temp., °F	Phosphate	NH_3-N Mg/l (Max.)	NO_3-N Mg/l (Max.)
Municipal Water Source	5.0	250	80	?	5	10
Industrial Process Water	10	250	90	NA	5	NA
Recreational						
A. Swimming & Water Skiing Total Body Contact	5	?	< 95	NA	Insuff. Info.	?
B. Boating, Hunting Partial Body Contact	10	?	95	NA	Insuff. Info.	?
Irrigation	NA	NA	NA	NA	NA	NA
Fish, Aquatic Life, Wildlife	10	250	< 95	NA	Insuff. Info.	?
Livestock Watering, Domestic	?	?	< 100	NA	?	Insuff. Info.
Miscellaneous						
A. Hydroelectric Power	NA	250	NA	NA	20	NA
B. Commercial Shipping	NA	250	NA	NA	20	NA
C. Cooling (Once-through)	NA	250	< 90	NA	20	NA
D. Waste Water Assimilation and Transport	20	Need more info.	< 110	NA	NA	NA
E. Esthetics	NA	NA	NA	NA	NA	NA

Comments

Phosphate as such are not a problem

Work now going on to determine maximum level of Phosphates for control of Algae.

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PROPOSED GUIDES FOR WATER QUALITY

INDUSTRIAL WATER WORK GROUP (CONT'D)

To be dropped from list

Water Uses	Organic N	Diss. Solids Mg/l (Max.)	Total Hardness Mg/l	Total Alkalinity	CCE Organics	APHA Color No.
Municipal Water Source	No Information Available	500	This is a natural property and in the region ranges from 130 - 400 ppm (It does not seem feasible to try to set guideline concentrations)	There shall be no OH alkalinity as indicated by the Phenolphthalein titration See APHA Manual 11th Edition for procedure of test	There is insufficient information available at this time for establishing numerical guideline values (Carbon-chloroform Extract)	50
Industrial Process Water		500				50
Recreational						
A. Swimming & Water Skiing Total Body Contact		NA				30
B. Boating, Hunting Partial Body Contact		NA				50
Irrigation		1,400				NA
Fish, Aquatic Life, Wildlife		5,000				10
Livestock Watering, Domestic		2,500				NA
Miscellaneous						
A. Hydroelectric Power		NA				NA
B. Commercial Shipping		NA				NA
C. Cooling (Once-through)		NA				NA
D. Waste Water Assimilation and Transport		Need more info				NA
E. Esthetics	NA	NA	NA	NA	NA	NA

Comments

W = Winter
S = Summer
? = Information unavailable regarding effects of this characteristic on the particular use.
NA = Not applicable

	B. Surface water body (stream, lake, ocean, etc.)	3-2	976.9		X		
	C. Ground (wells, spray, etc.)	3-3		2	3	4	
	D. Transferred to other users (after use in your establishment)	3-4*		2	3	4	
	E. TOTAL WATER DISCHARGED → (Sum of A, B, C, and D)	3-6	976.9				

ITEM 5

WATER TREATED

(Include simple as well as complex treatment):

1964

A. Intake water (included in item 1) treated prior to use except by chlorination only:

1. AMOUNT TREATED (millions of gallons for the year) . . . . . 31.0 — 4-1

2. Check methods of treatment: — 4-2

- ☐ 501 Aeration
- ☐ 502 Coagulation
- ☐ 503 Filtration
- ☒ 504 Softening
- ☐ 505 Ion exchange
- ☒ 506 Corrosion control
- Other (Specify):
  - ☐ 507 _____
  - ☐ 507 _____

B. Was it necessary to treat water reported in item 3 prior to recirculation or reuse? — 4-3

1. ☐ Yes 2. ☐ No

3. If "Yes," check methods of treatment:

- ☐ 511 Aeration
- ☐ 512 Coagulation
- ☐ 513 Filtration
- ☐ 514 Softening
- ☐ 515 Ion exchange
- ☒ 516 Corrosion control Item 3 c-4
- Other (Specify):
  - ☐ 517 _____
  - ☐ 517 _____

C. Water (included in item 4E) treated prior to discharge (including chlorination):

1. AMOUNT TREATED (millions of gallons for the year) . . . . . 156.0 — 4-4

2. Check methods of treatment: — 4-5

- ☐ 521 Coagulation
- ☒ 522 Primary settling
- ☐ 523 Secondary settling
- ☐ 524 Trickling filters
- ☐ 525 Activated sludge
- ☐ 526 Digestion
- ☒ 527 Ponds or lagoons
- Other (Specify):
  - ☐ 528 _____

FOR CENSUS USE ONLY	Key		3A	3C1	3C2	3C3	3C4		Key	4A	4B	4C	4D	5B1/5B2
	4-6	0							4-7					

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FOR CENSUS USE ONLY	Identification number	Industry	State	River Basin	0-1

		Millions of gallons for the year	Key
ITEM 1 **WATER INTAKE BY KIND AND SOURCE: 1964**	FRESH WATER FROM — —		
	A. Public water system (municipally or privately owned)	114.4	1-1
	B. Company surface water system, such as streams or lakes	----	1-2
	C. Company ground water system such as wells or deep springs	986.4	1-3
	D. **Total fresh water intake** (Sum of A, B, and C) →	1000.8	1-4
	BRACKISH (SALT) WATER FROM — —		
	E. Ocean, ponds, wells, etc. (Brackish water is defined as all water with more than 1,000 parts per million of dissolved solids)	----	1-5
	F. **TOTAL WATER INTAKE** (Sum of D and E) →	1000.8	1-6
ITEM 2 **PURPOSE OF WATER INTAKE: 1964**	A. Process (all water that comes directly in contact with products and/or materials)	~~320.9~~	2-1
	B. Cooling and condensing for steam electric power generation	~~260.8~~ 251.7	2-2
	C. Other cooling and condensing (including air-conditioning)	330.3	2-3
	D. Boiler feed, sanitary service, and other uses	68.8	2-4*
	E. **TOTAL INTAKE** (The sum of A, B, C, and D should equal item 1F) →	1000.8	2-6
ITEM 3 **WATER RECIRCULATION AND REUSE: 1964**	A. **Was any water recirculated or reused?** . . . . . 1 [X] Yes 2 [ ] No		
	B. If "Yes," report estimated total quantity of water which would have been required if no water was recirculated or reused (millions of gallons for the year)	1611.8	2-7
	C. Check each purpose for which water was recirculated or reused:		
	1. Process . . . . . [1] [X]		
	2. Condensing water for steam electric power generation . . . . . [1] [ ]		
	3. Other cooling and condensing (including air-conditioning) [1] [ ]		
	4. Boiler feed, sanitary service, and other uses . . . . . [1] [X]		

ITEM 4 **WATER DISCHARGED**

Report water discharged, whether treated or not. Exclude water evaporated or otherwise consumed and not brought to ultimate disch[illegible] point

Point of discharge	Key	Millions of gallons for the year	Water treated prior to discharge (Check applicable box)		
			None	Some	All